# AI AND INTELLECTUAL PROPERTY: CHALLENGES IN PATENTING AND COPYRIGHT AI GENERATED CREATIONS

**A**

**SYNOPSIS**

***Submitted in partial fulfilment of the***

***Requirements for the award of a degree***

***Of***

***Doctor of Philosophy***

***In the***

***Department of***

**Law**

**Submitted to**

**YBN UNIVERSITY**

**RAJAULATU, NAMKUM, RANCHI**

**JHARKHAND 834010 (INDIA)**

**September 2023**


**Research Supervisor:**

**DR.SHAMMI KESH ROY**

Associate Professor

Department of Law

**Research Scholar:**

**SURYA VISWANADHA**

Enrolment No. YBNU2201223

Department of Law

# Table of Content


| Sl. No. | Topic | Page No. |
|---|---|---|
| | **Abstract** | **1** |
| **1** | **Introduction** | **1** |
| **2** | **Review of Literature** | **3** |
| **3** | **The Methodology of the Study** | **10** |
| **4** | **Proposed Analyses** | **19** |
| **5** | **Delimitations of the Study** | **21** |
| **6** | **Conclusion** | **22** |
| | **References** | **25-26** |

# AI and Intellectual Property: Challenges in Patenting and Copyright AI Generated Creations


## Abstract

The rapid advancement of artificial intelligence (AI) technology presents significant challenges for traditional intellectual property (IP) frameworks, particularly in the domains of patenting and copyrighting AI-generated creations. This study investigates these challenges and explores potential solutions by examining the concepts of authorship and inventor ship, analyzing the impact of AI's data processing capabilities on patentability, and providing real-world case studies. Through a multi-method approach, including surveys, semi-structured interviews, focus group discussions, document analysis, and case studies, the research aims to clarify how current IP laws address AI-generated works and identify areas for reform. The study will begin by exploring the evolving definitions of authorship and inventor ship in the context of AI, assessing how existing legal frameworks accommodate non-human creators. It will analyze how AI's ability to process large datasets and generate innovative outputs affects traditional patentability criteria, providing insights into whether current standards are sufficient or need adjustment. Case studies will offer practical examples of the challenges and solutions encountered in patenting and copyrighting AI-generated creations, illustrating real-world applications and legal outcomes. In addition, the study will propose strategies for harmonizing international IP laws to create a more consistent global approach to AI-generated works. Recommendations will be developed for updating patent and copyright laws to better address the unique aspects of AI technology, ensuring that legal protections evolve in tandem with technological advancements. By integrating quantitative and qualitative data, the study will provide a comprehensive understanding of the complexities surrounding AI-generated IP, contributing to informed policy recommendations and legal reforms. The findings aim to enhance the effectiveness of IP frameworks in managing the emerging challenges posed by AI innovations, supporting a more adaptive and equitable approach to intellectual property in the age of AI.



**Keywords:** Artificial Intelligence (AI), Intellectual Property (IP), Patenting, Copyrighting, I-Generated Creations, Authorship, Inventor ship.


## 1. Introduction

The rapid development of artificial intelligence (AI) technologies has profoundly transformed various sectors, fostering unprecedented innovation and automation (Kerr, 2021). AI systems

are now capable of creating music, art, literature, and even inventions that rival human creativity and ingenuity. However, this progress has introduced significant complexities in the field of intellectual property (IP) law, particularly concerning the patenting and copyrighting of AI-generated creations (Elgendi et al., 2020). The primary challenge lies in the legal frameworks that were designed with human inventors and creators in mind, which do not readily accommodate non-human entities such as AI. One of the key issues is the question of authorship and inventor ship. Traditional IP laws require a human to be identified as the author or inventor to grant copyright or patent protection (Gervais, 2021). This poses a problem for AI-generated works, where the human input minimal or non-existent. For instance, the U.S. Copyright Office has consistently maintained that copyright protection is only available for works created by human beings (U.S. Copyright Office, 2019).Additionally; the patent system faces challenges with AI-generated inventions. Patents are granted for novel and non-obvious inventions that involve an inventive step (WIPO, 2019). Determining the novelty and inventive step of an AI-generated invention can be complicated, as AI, systems can analyze vast amounts of data and generate inventions that might not be apparent to human inventors. This raises questions about the criteria for patentability and the role of human inventors in the AI innovation process (Abbott, 2020). Moreover, the ownership of IP rights for AI-generated creations is contentious. If an AI system creates a new invention or work, it is unclear who holds the IP rights - the developer of the AI, the user who deploys it, or the AI itself (Aplin, 2020). This ambiguity can lead to legal disputes and uncertainty in the commercialization of AI-generated products. Furthermore, the global nature of AI development and deployment adds another layer of complexity. Different countries have varying IP laws and interpretations regarding AI-generated works, leading to inconsistencies and challenges in international protection and enforcement of IP rights (European Parliament, 2020). Thus, the intersection of AI and intellectual property law presents significant challenges that require a rethinking of traditional legal frameworks. Addressing these issues is crucial for fostering innovation while ensuring fair and equitable IP protection in the age of AI.

## 2. The Review of Related Literature

**Edwards, E. (2024).** Shedding light on the complex relationship between AI, art and copyright law. While it is not uncommon for a reviewer to have read various editions of an academic book, this reviewer also had the opportunity to interview the author on his radio show at CNN Radio Argentina back in June 2023. On that occasion, Carballo-Calero expanded upon the

difference between AI-generated works and AI-assisted works. This difference currently stands as one of the pivotal points of debate because of the difficulty in establishing the threshold that separates one from the other.

**Duflot, A. (2024).** Artificial Intelligence in the French Law of 2024. *Legal Issues in the digital Age*, (1), 37-56. AI is a source of fears, particularly for the respect of human rights, and requires a very elaborate legal and ethical environment that is flexible enough to avoid slowing down the development of AI. The AI Liability EU Directive complements the Artificial Intelligence Act by introducing a new liability regime that ensures legal certainty, enhances consumer trust in AI, and assists consumers' liability claims for damage caused by AI-enabled products and services. However, the new European AI Act does not resolve all issues that therefore need to be addressed nationally.

**Chesterman, S. (2024).** Good models borrow, great models steal: intellectual property rights and generative AI. *Policy and Society*, puae006. These topics fall in the realm of intellectual property, a legal framework designed to incentivize and reward only human creativity and innovation. For some years, however, Britain has maintained a distinct category for "computer-generated" outputs; on the input issue, the EU and Singapore have recently introduced exceptions allowing for text and data mining or computational data analysis of existing works. This article explores the broader implications of these policy choices, weighing the advantages of reducing the cost of content creation and the value of expertise against the potential risk to various careers and sectors of the economy, which might be rendered unsustainable. Lessons may be found in the music industry, which also went through a period of unrestrained piracy in the early digital era, epitomized by the rise and fall of the file-sharing service Napster. Similar litigation and legislation may help navigate the present uncertainty, along with an emerging market for "legitimate" models that respect the copyright of humans and are clear about the provenance of their own creations.

**Tyagi, K. (2024).** Copyright, text & data mining and the innovation dimension of generative AI. *Journal of Intellectual Property Law & Practice*, *19*(7), 557-570. This research article contemplates on the foregoing issues, and makes some recommendations to create a balanced framework, whereby incentives to innovate are preserved, and the interests of the human author are suitably safeguarded in the age of TDM and Generative AI.

**Worth, H. N., Crime, W. C., & East (2024).** M. Patent Laws and Regulations Watching Out For Lurking Hazards When Drafting Patent Applications; Using Generative Artificial

Intelligence 2024. N the patent arena, generative AI stands to disrupt traditional ways of drafting patent applications and the hierarchies that are built around them. In the near term, generative AI is poised to better harness existing patent-review capabilities that may improve a patent lawyer's efficiency and accuracy – e.g., proofing functions, specification and claim compliance with patent statutes, etc. In the longer term, as AI improves and increasingly can generate content in view of certain predictive patent analytics, AI may be used to draft some or most of a patent application. If AI begins to take a larger drafting role, the role of the patent lawyer, paralegals and other staff (like many other "cognitive" professional roles) will change, and may tend more heavily toward human judgment, insight, creativity, and the continued needs for human interactions – among clients, inventors, lawyers, and patent examiners.

**Yu, P. K. (2024).** The Future Path of Artificial Intelligence and Copyright Law in the Asian Pacific. *Computers and Law*, *96,* 24-18. This article concludes by offering three closing observations that aim to shed light on the future development of copyright norms in the AI area—both in the Asian Pacific region and at the global level. These observations address the following questions: (1) Are AI-related copyright law developments across the world converging or diverging? (2) How likely is it for us to see a future international treaty at the intersection of AI and copyright? (3) What is the best way forward to address human creations that have benefited from the use of generative AI tools in the creative process?

**Novelli, C., Casolari, F., Hacker, P., Spedicato, G., & Floridi, L. (2024).** Generative AI in EU law: liability, privacy, intellectual property, and cybersecurity. arXiv preprint arXiv: 2401.07348. The advent of Generative AI, particularly through Large Language Models (LLMs) like ChatGPT and its successors marks a paradigm shift in the AI landscape. Advanced LLMs exhibit multimodality, handling diverse data formats, thereby broadening their application scope. However, the complexity and emergent autonomy of these models introduce challenges in predictability and legal compliance. This paper delves into the legal and regulatory implications of Generative AI and LLMs in the European Union context, analyzing aspects of liability, privacy, intellectual property, and cybersecurity. It critically examines the adequacy of the existing and proposed EU legislation, including the Artificial Intelligence Act (AIA) draft, in addressing the unique challenges posed by Generative AI in general and LLMs in particular. The paper identifies potential gaps and shortcomings in the legislative framework and proposes recommendations to ensure the safe and compliant deployment of generative models, ensuring they align with the EU's evolving digital landscape and legal standards.

**Lemley, M. (2024).** How Generative AI Turns Copyright Law Upside Down. *Science and Technology Law Review*, *25*(2). While courts are litigating many copyright issues involving generative AI, from who owns AI-generated works to the fair use of training to infringement by AI outputs, the most fundamental changes generative AI will bring to copyright law don't fit in any of those categories. The new model of creativity, generative AI puts considerable strain on copyright's two most fundamental legal doctrines: the idea-expression dichotomy and the substantial similarity test for infringement. Increasingly, creativity will be lodged in asking the right questions, not in creating the answers. Asking questions may sometimes be creative, but the AI does the bulk of the work that copyright traditionally exists to reward, and that work will not be protected. That inverts what copyright law now prizes. In addition, because asking the questions will be the basis for copyright ability, similarity of expression in the answers will no longer be of much use in proving the copying of the questions. That means we may need to throw out our test for infringement, or at least apply it in fundamentally different ways.

### 2.1.The Research Gap of the Study

The intersection of artificial intelligence (AI) and intellectual property (IP) law reveals several critical research gaps, particularly in the realm of patenting and copyright for AI-generated creations. One significant challenge is determining the extent to which AI-generated innovations can be patented. Traditional patent law predicates inventor ship on human authorship, which creates ambiguity when AI systems, operating autonomously or semi-autonomously, produce novel inventions. This raises questions about how to attribute ownership and accountability for such creations. Another gap exists in understanding the scope of copyright protection for works generated by AI. Current copyright law is designed to protect works created by human authors, thus leaving a gray area regarding whether AI-generated content qualifies for protection, and if so, who holds the rights—whether it's the developer of the AI, the user, or the AI itself. Additionally, there is a need to explore the implications of AI's role in the creation process on traditional IP frameworks, including issues of originality, creativity, and the public domain. These gaps underscore the need for interdisciplinary research that integrates legal, technological, and ethical perspectives to develop coherent policies and frameworks that address the unique challenges posed by AI in the IP domain.

### 2.2.The Statement of the Problem

The emergence of artificial intelligence (AI) technologies has introduced complex challenges in the realm of intellectual property (IP), particularly concerning the patenting and copyright of AI-generated creations. Traditional IP laws, which are fundamentally designed around human inventors and creators, struggle to address the nuances introduced by AI systems capable of producing novel inventions and creative works. The core issue lies in the attribution of ownership and authorship—current patent and copyright frameworks do not account for the fact that AI systems can independently generate innovative and original outputs. This creates a significant research gap: how to redefine legal concepts of inventor ship and authorship to accommodate AI-generated creations. There is also a lack of clarity regarding the allocation of rights and responsibilities for these creations, whether they should be attributed to the AI itself, its developers, or its operators. Furthermore, existing legal doctrines do not adequately address the implications of AI's role in the creation process on concepts like originality and creativity, which are central to IP law. Addressing these gaps is crucial for developing a coherent and equitable legal framework that ensures appropriate protection and incentivizes innovation in the age of AI.

### 2.3.The Need and Significance of the Study

The study of AI and intellectual property (IP) is of paramount importance given the rapid advancement and increasing prevalence of artificial intelligence technologies in generating inventions and creative works. As AI systems become more sophisticated, they are capable of producing novel and original outputs that challenge traditional IP frameworks, which were not designed with such technologies in mind. The need for this study stems from the critical gaps in existing IP laws that fail to address the complexities associated with AI-generated creations, such as issues of authorship, inventor ship, and rights allocation. Understanding and addressing these challenges is significant for several reasons. First, a well-defined legal framework is essential to ensure that AI innovations are appropriately protected, encouraging further technological advancement and investment. Second, it is crucial to establish clear guidelines for the attribution of IP rights to avoid legal disputes and promote fair recognition of contributions. Third, this research can guide policymakers and legal practitioners in developing updated IP regulations that balance the interests of AI developers, users, and the public. Ultimately, the study will contribute to a more equitable and efficient IP system that fosters innovation while adapting to the evolving landscape of AI technology.

### 2.4.The Research Questions

**$RQ_1$:** What constitutes authorship and inventor ship in the context of AI-generated works?

**$RQ_2$:** How does AI's capability to process large datasets influence the novelty, non-obviousness, and utility assessments in patent applications?

**$RQ_3$:** What are some notable legal cases involving the patenting or copyrighting of AI-generated creations?

**$RQ_4$:** What strategies can be proposed to harmonize international IP laws to better accommodate AI-generated creations?

**$RQ_5$:** What specific aspects of current patent and copyright laws are inadequate for addressing AI-generated works?

### 2.5.The Research Objectives

**$O_1$**: To explore the concept of authorship and inventor ship in the context of AI-generated works.

**$O_2$**: To analyze how AI's ability to process large datasets and generate unique inventions affects the patentability assessment.

**$O_3$**: To provide case studies illustrating the challenges and solutions in patenting and copyrighting AI-generated creations.

**$O_4$**: To propose harmonization strategies for international IP laws regarding AI-generated works.

**$O_5$**: To develop recommendations for updating patent and copyright laws to better accommodate AI-generated creations.

### 2.6.The Purpose of the Study

**Exploration of Authorship and Inventor ship in AI-Generated Works**

The primary objective of this study is to explore and redefine the concepts of authorship and inventor ship as they pertain to works generated by artificial intelligence (AI). Traditional IP laws are centered on human creators and inventors, but AI technologies challenge these notions by autonomously producing novel and original outputs. This study aims to investigate how these traditional concepts can be adapted to reflect AI's role in the creative process. It will address questions related to the attribution of rights and recognition in the context of AI-generated works, providing a clearer understanding of how to acknowledge and reward contributions from AI systems and their developers.

**Analysis of AI's Impact on Patentability Assessment**

Another key objective is to analyze how AI's capability to process extensive datasets and generate unique inventions influences the assessment of patentability. AI systems can produce innovative solutions by leveraging complex algorithms and vast amounts of data, which introduces new dimensions to patent evaluation. This study will examine whether current patentability criteria, such as novelty, non-obviousness, and utility, are sufficient for AI-generated inventions or if they need to be revised. By exploring, how AI's data processing capabilities affect these criteria, the study will provide insights into whether and how patent standards should evolve to accommodate the nuances of AI-driven innovations.

**Case Studies on Patenting and Copyrighting AI-Generated Creations**

To illustrate the practical challenges and solutions associated with AI-generated works; this study will include case studies that highlight real-world examples of patenting and copyrighting issues. These case studies will provide an empirical basis for understanding how different jurisdictions handle the complexities of AI-generated content. By analyzing various cases, the study will identify common obstacles, effective strategies, and potential legal and procedural reforms. This approach will offer a comprehensive view of how AI-generated works are currently managed within the legal system and suggest ways to improve these processes.

**Proposal for Harmonization of International IP Laws**

Given the global nature of technological advancements, another significant objective of the study is to propose strategies for harmonizing international IP laws concerning AI-generated works. The disparity in IP laws across different jurisdictions can create challenges for global innovation and protection. The study will explore potential frameworks for aligning IP regulations on an international scale, ensuring consistency and effectiveness in the protection of AI-generated creations. By proposing harmonization strategies, the study aims to facilitate smoother interactions between legal systems and promote a more cohesive approach to managing IP rights in a global context.

**Recommendations for Updating IP Laws**

Finally, the study will develop recommendations for updating patent and copyright laws to better accommodate the realities of AI-generated creations. Building on the insights gained from exploring authorship and inventor ship, analyzing patentability issues, reviewing case studies, and proposing international harmonization strategies, the study will offer actionable

guidance for policymakers and legal practitioners. These recommendations will focus on creating a legal framework that is adaptive and responsive to the unique challenges posed by AI technologies, ensuring that IP laws continue to support innovation while effectively addressing the needs of the AI-driven era.

## 2.7. The Scope of the Study

### Exploration into Authorship and Inventor ship

The scope of this study encompasses a comprehensive examination of authorship and inventor ship as they relate to works generated by artificial intelligence (AI). This includes analyzing existing definitions and legal frameworks surrounding authorship and inventorship in intellectual property (IP) law and evaluating how these concepts apply to AI-generated works. The study will investigate the roles and responsibilities of AI systems, their developers, and users in the context of IP rights, aiming to determine how these traditional concepts can be adapted to address the unique characteristics of AI technologies. The scope will also cover comparative analysis across different jurisdictions to understand varying approaches to authorship and inventor ship in AI contexts.

### Analysis on Patentability Assessment

The study will extend to a detailed analysis of how AI's capacity to process extensive datasets and produce unique inventions influences the patentability assessment. This involves evaluating current patent criteria—such as novelty, non-obviousness, and utility—in light of AI-generated innovations. The scope includes investigating how AI's data-processing abilities challenge existing patent standards and exploring whether revisions or new criteria are necessary. The analysis will cover case law, patent office guidelines, and industry practices to understand how AI-generated inventions are currently assessed and where gaps or inconsistencies may exist.

### Case Studies

The scope includes an in-depth review of case studies that illustrate the practical challenges and solutions associated with patenting and copyrighting AI-generated creations. These case studies will encompass a range of examples from different industries and jurisdictions to provide a broad understanding of the issues involved. The study will analyze specific instances of AI-generated works that have faced legal challenges or have been successfully patented or copyrighted, highlighting both the obstacles encountered and the strategies employed to

address these challenges. The scope will also include an evaluation of the effectiveness of various legal approaches and remedies.

**Harmonization Strategies**

This study will explore strategies for harmonizing international IP laws related to AI-generated works, addressing the need for consistency across different legal systems. The scope includes examining existing international IP agreements, treaties, and national laws to identify areas of divergence and opportunities for alignment. The study will propose frameworks for achieving international harmonization, considering the diverse legal, economic, and cultural contexts that influence IP law. The aim is to facilitate a coherent and unified approach to managing AI-generated creations on a global scale, promoting fair and effective protection for innovators across borders.

**Recommendations for Updating IP Laws**

The final scope of the study involves developing targeted recommendations for updating patent and copyright laws to better accommodate AI-generated creations. This includes proposing specific legal reforms or amendments to existing laws to address the unique challenges posed by AI technologies. The scope will cover recommendations for both national and international legal frameworks, aiming to create a more adaptive and responsive IP system. The study will also consider stakeholder perspectives, including those of AI developers, IP practitioners, and policymakers, to ensure that the proposed recommendations are practical, equitable, and supportive of innovation.

## 3. The Methodology of the Study

The methodology of this study on the challenges of patenting and copyrighting AI-generated creations is designed to provide a comprehensive analysis of the evolving intersection between artificial intelligence (AI) and intellectual property (IP) law. The study will begin with an extensive literature review to establish a theoretical foundation, examining scholarly articles, legal texts, and industry reports related to authorship, inventor ship, and the patentability of AI-generated works. This review will help to identify existing gaps in the current understanding and provide a basis for further analysis. Following the literature review, the study will engage in a conceptual analysis to redefine the concepts of authorship and inventor ship in the context of AI. This will involve clarifying traditional IP concepts and exploring how they can be adapted to accommodate the unique nature of AI as a creator or inventor. The analysis will consider both legal and philosophical perspectives, aiming to develop a nuanced understanding

of how AI fits into existing IP frameworks. In assessing the impact of AI on patentability, the study will employ a multifaceted approach. This includes analyzing relevant case law where AI-generated inventions have been evaluated, reviewing patent office guidelines and criteria, and conducting interviews with patent attorneys and IP experts. This approach will help to understand how current patent standards address (or fail to address) the novel aspects of AI-generated inventions and whether there is a need for revised criteria. Case studies will play a critical role in illustrating practical challenges and solutions related to patenting and copyrighting AI-generated works. The study will select notable cases from various jurisdictions and industries, analyzing the legal issues encountered and the strategies employed to address them. This comparative analysis will provide insights into effective practices and highlight common obstacles in managing AI-generated IP. To address the need for international consistency, the study will propose harmonization strategies for IP laws. This will involve reviewing existing international IP agreements and identifying areas where national laws diverge. The study will then develop frameworks for harmonizing IP laws to ensure a coherent approach to protecting AI-generated works on a global scale. Finally, the study will synthesize findings from all previous components to develop actionable recommendations for updating patent and copyright laws. This process will involve consultations with policymakers, IP professionals, and AI developers to refine and validate the recommendations. The goal is to create a legal framework that effectively addresses the challenges posed by AI technologies and supports innovation while ensuring fair and adequate protection for AI-generated creations.

### 3.1.Research Design

The research design for this study on the challenges of patenting and copyrighting AI-generated creations adopts a multi-faceted approach to thoroughly investigate the intersection of artificial intelligence (AI) and intellectual property (IP) law. The study begins with a comprehensive literature review to establish a solid theoretical foundation, examining existing research, legal texts, and industry reports related to AI and IP. This review helps identify current gaps and informs the direction of subsequent analyses. Building on this foundation, the study employs a mixed-methods approach, combining qualitative and quantitative techniques to address its objectives. Data collection involves a combination of primary and secondary sources. The primary data will be gathered through structured surveys distributed to IP professionals, patent attorneys, and AI developers, providing quantitative insights into their experiences and perceptions of AI-generated IP issues

## 3.2.The Participants of the Study

### Participants of the Study

The participants for this study on the challenges of patenting and copyrighting AI-generated creations will be carefully selected to provide a comprehensive and diverse perspective on the issues at hand. The study will include a range of stakeholders involved in AI technologies, intellectual property (IP) law, and related fields.

### IP Professionals

**Description:** This group includes patent attorneys, copyright lawyers, and IP consultants who have experience dealing with IP issues related to AI technologies.

**Role:** IP professionals will provide insights into the practical challenges and legal considerations involved in patenting and copyrighting AI-generated creations. They will be instrumental in identifying gaps in current IP frameworks and evaluating the effectiveness of existing legal strategies.

**Selection Criteria:** Participants will be selected based on their expertise in IP law, particularly those with experience in handling cases involving AI technologies. Their professional background, including years of practice and relevant case experience, will be considered.

### Patent Attorneys

Description: Patent attorneys specialize in securing patents for inventions and navigating patent laws. They play a crucial role in determining patentability and advising clients on patent-related matters.

**Role:** These participants will offer detailed perspectives on how AI-generated inventions are assessed for patentability, the challenges they encounter, and potential reforms needed in patent laws to better address AI technologies.

**Selection Criteria:** Patent attorneys will be chosen based on their involvement with AI-related patent applications and their familiarity with current patent examination processes and guidelines.

### Copyright Lawyers

**Description:** Copyright lawyers focus on protecting creative works through copyright law. Their expertise will be valuable in understanding how AI-generated works are treated under copyright frameworks.

**Role:** Copyright lawyers will provide insights into the challenges of copyrighting AI-generated content, including issues of authorship and originality, and suggest potential improvements to copyright law.

**Selection Criteria:** Participants will be selected for their experience with copyright cases involving AI-generated works and their understanding of copyright law as it applies to new technologies.

**AI Developers and Technologists**

**Description:** AI developers and technologists are professionals involved in creating and implementing AI systems. They have a deep understanding of AI technologies and their capabilities.

**Role:** These participants will offer technical insights into how AI systems generate innovations and creative works, which will help contextualize the legal challenges identified by IP professionals.

**Selection Criteria:** AI developers will be selected based on their experience with AI systems that produce novel outputs and their ability to provide detailed information about the technology's impact on IP issues.

**Industry Practitioners**

**Description:** Industry practitioners include professionals from sectors heavily impacted by AI, such as technology, entertainment, and pharmaceuticals.

**Role:** They will offer practical perspectives on how AI-generated creations affect their industries and the real-world implications of current IP laws. Their feedback will help ensure that recommendations are relevant and applicable to industry needs.

**Selection Criteria:** Participants will be chosen based on their involvement with AI technologies and their roles in sectors where IP issues related to AI are prevalent.

**Legal Scholars and Academics**

Description: Legal scholars and academics specializing in IP law and technology will provide theoretical and research-based insights into the studies focus areas.

**Role:** These participants will contribute to the development of new legal concepts and frameworks by offering critical analysis and reviewing existing literature and legal doctrines related to AI and IP.

**Selection Criteria:** Scholars will be selected based on their published research on IP law, technology, and AI, as well as their academic contributions to the field.

**Policymakers and Regulators**

**Description:** Policymakers and regulators involved in constructing and enforcing IP laws will provide insights into the legislative and regulatory aspects of managing AI-generated creations.

**Role:** They will offer perspectives on the feasibility of proposed legal reforms and strategies for harmonizing international IP laws. Their involvement is crucial for ensuring that recommendations align with policy considerations.

**Selection Criteria:** Participants will be chosen based on their roles in IP law formulation and their expertise in regulatory frameworks relevant to AI technologies.

By engaging these diverse participants, the study will obtain a well-rounded view of the challenges and potential solutions for patenting and copyrighting AI-generated works, ensuring that the findings and recommendations are both comprehensive and practically applicable.

### 3.3.The Variables of the Study

In the study on the challenges of patenting and copyrighting AI-generated creations, variables will be classified into independent and dependent categories to systematically analyze the relationships and impacts within the research framework.

**Independent Variables**

Independent variables are those factors that are manipulated or categorized to observe their effects on dependent variables. In this study, the independent variables include:

**Nature of AI Technology**

This variable encompasses different types of AI technologies used to generate creative and innovative outputs. It includes machine learning models, neural networks, generative algorithms, and other AI techniques.

**Current IP Legal Frameworks**

This variable refers to the differences in IP laws and regulations across various jurisdictions. It includes variations in legal practices and standards for patenting and copyrighting AI-generated creations.

**Stakeholder Perspectives**

This variable includes the views and experiences of various stakeholders, such as IP professionals, AI developers, industry practitioners, legal scholars, and policymakers.

**Dependent Variables**

Dependent variables are the outcomes or effects that are measured in response to changes in the independent variables. In this study, the dependent variables include:

**Assessment of Patentability**

This variable measures how AI-generated inventions are evaluated for patentability, including criteria such as novelty, non-obviousness, and utility.

**Challenges in Copyrighting Measurement:**

This variable refers to the difficulties encountered in copyrighting AI-generated works, including issues related to authorship, originality, and ownership.

**Effectiveness of Legal Frameworks**

This variable measures how well current IP laws and regulations address the challenges associated with AI-generated works.

**International Harmonization**

This variable measures the extent to which international IP laws and practices are harmonized to handle AI-generated creations.

**Recommendations for Legal Reform**

This variable includes the proposed changes to patent and copyright laws based on the study's findings. By analyzing these independent and dependent variables, the study aims to understand the complex dynamics between AI technologies and intellectual property law, ultimately providing insights and recommendations for addressing the challenges associated with AI-generated creations.

### 3.4.The Conceptual Definitions of the Study

In examining the challenges of patenting and copyrighting AI-generated creations, it is essential to define several key concepts to provide clarity and establish a framework for analysis. These conceptual definitions help delineate the study's scope and ensure a coherent understanding of the issues being explored.

**Artificial Intelligence (AI):** AI refers to systems or machines that simulate human intelligence to perform tasks and can iteratively improve their performance based on data. In the context of this study, AI encompasses various technologies, including machine learning, neural networks, and generative algorithms, which are capable of creating novel outputs such as inventions, literary works, or artistic expressions. AI's capacity to generate these creations challenges traditional notions of creativity and authorship.

**Authorship:** Authorship is the recognition of the individual or entity responsible for the creation of a work, typically in the context of copyright law. It is traditionally attributed to human creators who produce original works of authorship. In the context of AI-generated works, authorship becomes complex as AI systems can autonomously produce content without direct human input. This raises questions about who should be credited as the author—whether it is the AI itself, its developers, or another party involved in the creation process.

**Inventor ship:** Inventor ship refers to the identification of the individual or entity who contributes to the conception of an invention, as defined in patent law. This concept is crucial for determining patent rights and responsibilities. For AI-generated inventions, the issue of inventor ship becomes intricate because AI systems can independently develop novel ideas or solutions. The challenge lies in defining whether the AI system, its creators, or another stakeholder should be recognized as the inventor under existing patent laws.

**Patentability:** Patentability is the assessment of whether an invention meets the criteria required to obtain a patent. These criteria typically include novelty, non-obviousness, and utility. The advent of AI technology complicates patentability assessments as AI systems can process vast amounts of data and generate highly innovative solutions. The study will explore how these unique aspects of AI-generated inventions influence their evaluation against traditional patentability standards.

**Copyright:** Copyright is a legal framework that grants exclusive rights to the creator of an original work of authorship, including the right to reproduce, distribute, and display the work. In the context of AI-generated creations, copyright challenges arise regarding the attribution of

rights and protection of works produced by AI systems. This includes issues of originality and the extent to which AI-generated content can be considered original and deserving of copyright protection.

**Jurisdictional Differences:** Jurisdictional differences refer to the variations in IP laws and practices across different countries or legal systems. These differences can affect how AI-generated works are treated under patent and copyright laws. The study will examine how these variations influence the consistency of IP protection for AI-generated creations and explore strategies for achieving greater international harmonization.

**Harmonization:** Harmonization in this context refers to the process of aligning international IP laws and regulations to create a consistent and unified approach to managing AI-generated works. The goal is to address discrepancies between different legal systems and establish a coherent framework that facilitates the protection of AI-generated creations on a global scale.

**Recommendations for Legal Reform:** Recommendations for legal reform involve proposing changes or updates to existing patent and copyright laws to better accommodate the challenges posed by AI technologies. These recommendations aim to address identified gaps and improve the effectiveness of IP laws in protecting AI-generated works while fostering innovation and creativity.

These conceptual definitions provide a foundation for understanding the key issues addressed in the study and facilitate a structured analysis of the challenges and opportunities related to patenting and copyrighting AI-generated creations.

### 3.5.The Method of Data Collection

## Primary Source

The primary data collection for this study will employ two key qualitative methods: interviews and focus group discussions. These approaches are designed to gather rich, detailed insights from experts and stakeholders involved with AI-generated intellectual property (IP) issues.

**Interviews:** will be conducted to obtain in-depth, individual perspectives from a diverse group of professionals. This method will involve semi-structured interviews with key stakeholders, including IP attorneys, copyright experts, patent examiners, AI developers, and industry practitioners. The semi-structured format will allow for a flexible yet focused exploration of topics such as the challenges faced in patenting and copyrighting AI-generated works, the effectiveness of current legal frameworks, and personal experiences with AI-related IP issues.

Each interview will be guided by a set of pre-determined questions but will also allow open-ended discussion to capture nuanced views and unexpected insights. The interviews will be recorded (with participants' consent), transcribed, and analyzed thematically to identify common themes, challenges, and potential solutions.

**Focus Group Discussions**: will be used to facilitate a collaborative exchange of ideas among a group of experts and stakeholders. These discussions will involve small groups of participants from similar professional backgrounds, such as IP lawyers or AI developers, who can provide diverse perspectives and engage in dynamic discussions about AI-generated IP issues. Focus groups will be structured to encourage open dialogue on specific topics, such as the impact of AI on traditional IP frameworks, potential reforms, and international harmonization strategies. Moderated by the research team, focus groups will use a structured discussion guide to ensure that key topics are covered while allowing participants to express their views freely. The sessions will be recorded, transcribed, and analyzed to understand group dynamics and consensus on various issues.

By combining interviews and focus group discussions, the study will benefit from both individual and collective insights. Interviews will offer deep, personalized understanding of specific challenges and experiences, while focus groups will provide a broader view of the consensus and divergent opinions within groups of experts. This dual approach will ensure a comprehensive analysis of the complexities surrounding AI-generated intellectual property and contribute to well-informed recommendations for addressing the identified issues.

## Secondary Source

In the study of patenting and copyrighting AI-generated creations, secondary data collection will focus on document analysis and case studies. These methods will provide contextual and historical insights into how AI-related IP issues are addressed and managed.

**Document Analysis:** involves a thorough review of existing records and documents relevant to AI-generated intellectual property (IP). This method will include analyzing legal texts, patent filings, copyright registrations, regulatory guidelines, and industry reports. The objective is to understand how current IP frameworks handle AI-generated works and to identify any gaps or inconsistencies in the existing laws and practices.

**Case Studies**: will involve an in-depth examination of specific instances where AI-generated creations have been subject to IP processes. These case studies will be selected based on their

relevance to the study's objectives and their illustrative value in highlighting the practical challenges and solutions in AI-related IP issues.

By utilizing document analysis and case studies, the study will gain a comprehensive understanding of the current state of AI-related IP laws and practices. Document analysis will offer a broad overview of existing legal and regulatory frameworks, while case studies will provide concrete examples and insights into the practical application of these frameworks. Together, these methods will contribute to identifying gaps, challenges, and opportunities for reform in the protection of AI-generated creations.

## 4. Proposed Analyses

The proposed analyses for the study on patenting and copyrighting AI-generated creations will employ a multi-method approach to gain comprehensive insights into the challenges and solutions in this field. Qualitative analysis will focus on thematic analysis of semi-structured interviews and focus group discussions, extracting detailed insights and thematic patterns from the narratives of experts and practitioners. Case studies will be analyzed to provide a detailed examination of specific instances where AI-generated inventions and creative works have been subject to IP processes, highlighting practical challenges and outcomes. Document analysis will involve a thorough review of legal texts, patent filings, copyright registrations, and regulatory guidelines to assess how current IP frameworks address AI-generated creations and identify gaps or inconsistencies. This approach will ensure a well-rounded understanding of the current state of AI-related IP laws and practices, facilitating the development of actionable recommendations for improving legal protections and addressing emerging challenges.

### 4.1. The Expected Outcome of the Study

**Exploration of Authorship and Inventor ship in AI-Generated Works**

The study aims to provide a comprehensive understanding of the evolving concepts of authorship and inventor ship in the context of AI-generated works. By examining how AI systems create novel outputs, the study expects to clarify the legal and philosophical implications of attributing authorship and inventor ship to non-human entities. The expected outcome includes a detailed analysis of current legal frameworks and proposed adjustments to address the unique challenges posed by AI. This outcome will contribute to a clearer definition of who qualifies as an author or inventor when AI is involved, offering guidance for legal practitioners and policymakers.

**Impact of AI on Patentability Assessment**

The study anticipates revealing how AI's capability to process extensive datasets and generate innovative inventions influences the patentability assessment. The expected outcome includes a nuanced evaluation of how AI-generated inventions align with traditional patent criteria such as novelty, non-obviousness, and utility. By analyzing specific cases and technological advancements, the study will provide insights into whether existing patent laws adequately accommodate AI-generated innovations or if they require reform. This outcome will offer valuable information for patent examiners, legal scholars, and AI developers regarding the challenges and opportunities in patenting AI-driven inventions.

**Case Studies on Patenting and Copyrighting AI-Generated Creations**

Through detailed case studies, the study expects to illustrate practical challenges and effective solutions encountered in the patenting and copyrighting of AI-generated creations. These case studies will highlight real-world examples where AI-related IP issues have been addressed, providing insights into the legal processes, outcomes, and strategic approaches taken. The expected outcome is a collection of illustrative cases that demonstrate the complexities of applying IP laws to AI-generated works and offer practical lessons for handling similar issues in the future. This will serve as a critical resource for legal practitioners, policymakers, and industry stakeholders.

**Harmonization Strategies for International IP Laws**

The study aims to propose strategies for harmonizing international IP laws to better manage AI-generated works. The expected outcome includes a set of recommendations for aligning legal frameworks across different jurisdictions to create a more consistent and effective global approach to AI-generated IP. This will involve identifying gaps and inconsistencies in current international agreements and proposing actionable solutions for achieving greater legal coherence. The outcome will provide policymakers and international organizations with a roadmap for enhancing the global IP system to accommodate technological advancements.

**Recommendations for Updating Patent and Copyright Laws**

Finally, the study expects to develop comprehensive recommendations for updating patent and copyright laws to better address the unique challenges posed by AI-generated creations. The anticipated outcome includes a set of proposed legal reforms and policy adjustments designed to improve the protection and management of AI-generated IP. These recommendations will

be based on the study's findings and aim to ensure that IP laws are responsive to the evolving landscape of AI technology. The outcome will offer actionable guidance for legislators, legal experts, and industry stakeholders to support the development of more effective and equitable IP frameworks.

Overall, the studies expected outcomes would provide valuable insights and practical solutions for addressing the legal challenges associated with AI-generated works, contributing to more effective IP protection and management in the era of advanced AI technologies.

## 5. The Delimitations of the Study

The study on patenting and copyrighting AI-generated creations will be bounded by several delimitations to focus the research and ensure its manageability. These delimitations define the scope and constraints of the study, shaping its direction and applicability. The key delimitations include:

### Geographic Scope

The study will primarily focus on intellectual property (IP) laws and practices within major jurisdictions such as the United States, the European Union, and India. While these regions represent significant legal frameworks and technological advancements, the findings may not be directly applicable to all countries with varying IP regulations. The study will not extensively cover jurisdictions with markedly different legal approaches to IP or those with minimal engagement in AI technology.

### Technological Scope

The research will concentrate on specific types of AI technologies that are currently prominent in generating creative and inventive outputs, such as machine learning algorithms and generative adversarial networks. The study will not encompass all AI technologies, particularly those that are less relevant to the creation of intellectual property or those emerging beyond the study's timeframe.

### Types of IP Covered

The focus will be on the challenges related to patenting and copyrighting AI-generated works. While the study will touch on related IP issues, such as trademarks or trade secrets, it will not delve deeply into these areas. The emphasis will be on understanding how current patent and copyright frameworks address the unique aspects of AI-generated creations.

**Methodological Scope**

The study will use qualitative and quantitative methods, including surveys, semi-structured interviews, focus groups, document analysis, and case studies. However, the research will not include experimental methods or large-scale empirical testing of legal frameworks. The focus will be on gathering insights from existing literature, legal documents, and expert opinions rather than conducting extensive field experiments.

**Time Frame**

The research will consider developments in AI and IP law up to the point of study completion. It will not account for future advancements in AI technology or anticipated legal reforms beyond the current knowledge base. The study will rely on the latest available data and case studies, but it will not speculate on future trends or hypothetical scenarios.

**Stakeholder Focus**

The study will target specific stakeholders, including IP professionals, AI developers, legal scholars, and industry practitioners. It will not include perspectives from broader public stakeholders or non-experts in the field, which may limit the inclusiveness of the views collected.

These delimitations are designed to narrow the focus of the research and provide a clear framework for analyzing the challenges and solutions related to patenting and copyrighting AI-generated creations. They help define the boundaries within which the study will operate, ensuring that the research is both feasible and relevant to current issues in the field.

## 6. Conclusion

This study aims to address the multifaceted challenges of patenting and copyrighting AI-generated creations by exploring key areas of concern and proposing actionable solutions. Through a detailed examination of authorship and inventor ship, the research will clarify the evolving legal definitions and their implications in the context of AI technology. By analyzing how AI's capabilities influence patentability assessments, the study will reveal whether existing criteria adequately accommodate innovative AI-driven inventions or if they require modification. The case studies will provide practical insights into real-world issues encountered in the patenting and copyrighting processes, highlighting both challenges and effective solutions. These case studies will serve as illustrative examples, offering valuable lessons for navigating the complexities of AI-related IP matters. Furthermore, the study will

propose strategies for harmonizing international IP laws, aiming to create a more consistent global framework that effectively addresses the unique aspects of AI-generated works. Finally, the study will develop recommendations for updating patent and copyright laws to better align with technological advancements in AI. These recommendations will be grounded in the research findings and aimed at improving legal protections and management of AI-generated IP. By synthesizing quantitative data from surveys, qualitative insights from interviews and focus groups, and evidence from document analysis and case studies, the study will contribute to a comprehensive understanding of AI-related IP issues and offer practical guidance for policymakers, legal practitioners, and industry stakeholders. Thus, the study will provide a well-rounded analysis of the current state of IP law as it pertains to AI-generated creations, highlight gaps and challenges, and propose informed solutions to advance the legal framework in this rapidly evolving field.

## Tentative Chapterisation

**Chapter 1: Introduction**

Background and Context

Statement of the Problem

Objectives of the Study

Significance of the Study

**Chapter 2: Literature Review**

Study Conducted in an International Scenario

Study Conducted in National Scenario

Summary of Key Findings

Research Gap

Conclusion

**Chapter 3: Methodology**

Research Design

Data Collection Methods

Data Analysis Techniques

Limitations of the Study

**Chapter 4: Exploring Authorship and Inventorship in AI-Generated Works and its Impact on Patentability Assessment**

Legal Definitions of Authorship and Inventorship

The Role of AI in Creative and Inventive Processes

Philosophical and Legal Implications

Stakeholder Perceptions

Influence of AI on Novelty, Non-Obviousness, and Utility

Challenges in Patent Examination of AI-Generated Inventions

Case Studies of Patent Decisions Involving AI

**Chapter 5: Case Studies on Patenting and Copyrighting AI-Generated Creations** and **Harmonization Strategies for International IP Laws**

Legal Challenges in Patenting AI-Generated Inventions

Legal Challenges in Copyrighting AI-Generated Works

Solutions and Best Practices from Case Studies

Proposed Strategies for Harmonization

International Cooperation and Policy-Making

**Chapter 6: Recommendations for Updating Patent and Copyright Laws**

Proposed Legal Reforms for Copyrights

Balancing Interests of Stakeholders

Potential Impacts of Recommended Changes

Contributions to the Field

Implications for Policy and Practice

Limitations of the Study

Suggestions for Future Research

Concluding Remarks

**References**


- Abbott, R. (2020). *The Reasonable Robot: Artificial Intelligence and the Law*. Cambridge University Press.
- Chiou, T. (2022). Copyright ownership challenge arising from AI-generated works of art: A time to stand and stare. In *Research Handbook on Intellectual Property and Cultural Heritage* (pp. 250-273). Edward Elgar Publishing.
- Cuntz, A., Fink, C., & Stamm, H. (2024). Artificial Intelligence and Intellectual Property: An Economic Perspective. *World Intellectual Property Organization (WIPO) Economic Research Working Paper Series*, (77).
- Cuntz, A., Fink, C., & Stamm, H. (2024). Artificial Intelligence and Intellectual Property: An Economic Perspective. *World Intellectual Property Organization (WIPO) Economic Research Working Paper Series*, (77).
- Chesterman, S. (2024). Good models borrow, great models steal: intellectual property rights and generative AI. *Policy and Society*, puae006.
- Hartmann, C., Allan, J. E., Hugenholtz, P. B., Quintais, J. P., & Gervais, D. (2020). Trends and Developments in Artificial Intelligence: Challenges to the Intellectual Property Rights Framework.
- Kalwani, M. Navigating Challenges and Proposing Solutions: The Interplay of Jurisdiction in Artificial Intelligence and Intellectual Property. In *Intellectual Property Rights and Competition Law in India* (pp. 206-217). Routledge.
- Marinkovic, A. R. (2024). IP rights and AI-the impact of the new EU AI Act and prospects of future legislative interventions. *Global journal of business and integral security*, *1*(2).
- Miziša, I. (2024). Patent rights in AI-generated data.

- Naim, N. (Ed.). (2024). *Developments in Intellectual Property Strategy: The Impact of Artificial Intelligence, Robotics and New Technologies*. Springer Nature.
- Novelli, C., Casolari, F., Hacker, P., Spedicato, G., & Floridi, L. (2024). Generative AI in EU law: liability, privacy, intellectual property, and cybersecurity. *ArXiv preprint arXiv: 2401.07348*.
- Saidakhrarovich, G. S., Hoeren, T., Gulyamov, S., Rustambekov, I., Zolea, S., Juchniewicz, E., & Rodionov, A. Democratizing Innovations: A New Perspective on Intellectual Property to Advance Social Justice in the Age of Ai. *Available at SSRN 4826900*.
- Samuelson, P. (2016). Are patents on AI algorithms per se patentable subject matter? *Berkeley Technology Law Journal, 31*(4), 1515-1565.
- Soni, T. (2024). Dissertation on Impact of AI Creations in IPR Framework.
- Tanwar, P., & Poply, J. (2024). Navigating the AI IP Nexus: Legal Complexities and Forward Paths for Intellectual Property in the Age of Artificial Intelligence. *Available at SSRN 4804599*.
- Vescovo, S. (2023). Rise of the Machines: The Future of Intellectual Property Rights in the Age of Artificial Intelligence. *Brook. L. Rev.*, *89*, 221.
- Zekos, G. I., & Zekos, G. I. (2021). AI and IPRs. *Economics and Law of Artificial Intelligence: Finance, Economic Impacts, Risk Management and Governance*, 461-489.
- Westkamp, G. (2019). *Handbook of Intellectual Property Research: Lenses, Methods, and Perspectives*. Edward Elgar Publishing.
- World Intellectual Property Organization. (2020). *WIPO Technology Trends 2019: Artificial Intelligence*. Retrieved from https://www.wipo.int/tech_trends/en/artificial_intelligence/